REMARKS

Applicant respectfully requests entry of this Amendment and reconsideration of the pending claims. New claims 147-155 are added. Claims 104-106, 112, 130, and 145-155 are currently pending.

With regard to the rejection under 35 USC § 102(b) as being anticipated by Wilson et al., Applicant submits that the apparatus shown or disclosed differs from the invention as defined at least in independent claims 104 and 146. Ignored are the recitations of "to maintain the chamber at a substantially constant volume" and "to maintain the chamber at about a constant volume".

The core 16 indicated in the Office Action as anticipating the restraint is not bounded on at least two sides as shown in Fig. 1. The top and the bottom of the core 16 of Wilson et al are open. The core 16 of Wilson et al. provides, at best, two-dimensional control, and cannot provide three-dimensional control. "Volume" is a three-dimensional unit. A prior art element having both the function and structure of the restraint as defined in the independent claim is not shown. Accordingly, Applicant expects that a rejection based on an accumulation of prior art elements (the core 16 plus the two press pistons 23 and 24) would similarly not anticipate the independent claims. In summary, there is no corresponding structure in the cited art that has the structure and performs the function of at least one of the elements in each of the independent claims.

Neither the structure nor the function of the claimed invention is disclosed in any of the cited references. Applicant submits that the rewritten claims 104 and 146 are allowable over the cited references.

Claim 105 states "the restraint is operable to counterbalance pressure in the capsule". Wilson et al. discloses the core 16 is a tungsten carbide core (column 3, line 12). In lines 15-20 (still column 3), the bores, and counterbores cooperate with the pistons "...to impose pressure on the sample..." Applicant has gone to great lengths to

indicate that actively imposing pressure differs from providing a counterbalancing pressure. The Office Action would vitiate that distinction.

Claims 112 and 130 depend from an allowable claim, and are therefore also allowable. Claim 130 is amended in another good faith attempt to functionally define the quality, character or attribute of the restraint that is measurable as a pressure response. Applicant believes that the "pressure response" function is now positively set forth as an element of the claim using acceptable functional claim language. If more suitable language is known than what is provided for in claim 130, Applicant would be more than willing to make the amendment, by Examiner amendment if preferable.

Claim 145 depends from an allowable claim and defines a capsule that can exert an internal a pressure of greater than about 60 kBar. Pressure limits for capsules or cells in Wilson et al. are disclosed to be up to 60 kBars (col. 2, l. 58, and col. 3, l. 44, respectively). For at least claim 145, Wilson et al. does not disclose or enable a pressure capability approaching the claim definition. Without disclosure of the claim elements, there can be no anticipation.

Claims 104-106, 112, 130 and 145 were rejected under 35 USC § 102(b) as being anticipated by Buehler. Claim 104 is amended to include "that the determined temperature is at least about 800 degrees Celsius". Support is found literally in the Examples section. For safety, the crystal growing temperature in the cited reference should be maintained below 573 degrees Celsius. (Col. 6, line 65). The amended claim 104 is not anticipated by the cited reference. The remaining claims 105-106, 112, 130 and 145 depend from the allowable claim, and are therefore also allowable.

Applicant would like to note again that, while supercritical fluid may not be a positive element recitation in some instances, the term does qualify as functional language modifying an attribute of a positively recited claim element. As functional language the term does have patentable weight. Particularly, the term functionally qualifies a structural element that is positively set forth in clear language. A functional

limitation defines something by what it can do, rather than by what it is (e.g., as evidenced by its specific structure). A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation may be used in association with an element to define a particular capability or purpose that is served by the recited element. An analogy may be had with reference to waterproof boots – the fact that there is no water currently in contact with those boots does not negate the substantive, functional qualifier of "waterproof".

The functional language used herein sets definite boundaries on the patent protection sought. *In re Barr*, 444 F.2d 588, 170 USPQ 33 (CCPA 1971). Further, the functional language precisely defines present structural attributes of the claimed element. *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976). By refusing to consider all of the terms and elements of the claims, Applicant submits that there is clear error in the rejections listed in the Office Action.

With regard to claim 112, also allowable over the cited reference for other reasons, the structural element that the Office Action identifies as "a clamp (i.e., caps 15, 16 of bomb 13)" is misconstrued. If the caps are to be the "clamp", then the "restraint" cannot be the bomb. That is, the bomb would need to control the volume, which it cannot do if the caps are excluded. However, if the caps are counted as part of the bomb to anticipate the restraint, then there is no clamp structural element remaining to anticipate claim 112.

Claim 146 is rejected under 35 USC § 102 as being anticipated by Flanigen et al. Claim 146 is amended to define a structure capable of maintaining a seal at a pressure range of from 5 kBar (about 75,000 psi) to about 80 kBar, and Flanigen et al. shows an example of not more than 20,000 psi as indicated in the Office Action. Flanigen et al. does not disclose a capsule as defined in amended claim 146, and does not anticipate amended claim 146.

Claim 106 was rejected under 35 USC § 103 over Wilson et al in view of Hall et al. Claim 106 recites a "heating system that includes the energy source and a temperature sensor, wherein the temperature sensor is disposed proximate to the capsule and is operable to sense a temperature of the capsule". The Office Action admits that Wilson et al. "is silent as to the control system being operable to provide a closed loop temperature control of the heating system, in response to a signal generated by a temperature sensor disposed proximate to the capsule". The Office Action continues, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a temperature sensor and to configure a closed loop temperature control scheme for the control system in the apparatus of Wilson et al. on the basis of suitability for intended use".

However, Applicant submits that this is not the standard for a *prima facie* case of obviousness. That a cited reference *may be* modified is not the standard, rather a reason for the combination or modification must be given. Clearly, Wilson et al did not believe a sensor was necessary, otherwise they would have disclosed one. Similarly, Hall et al. does not disclose other elements of the claimed invention because that was not the intent or understanding of Hall et al. For the cited art to be combined, without the benefit of impermissible hindsight reconstruction, there must be some reason or motivation provided beyond mere "because it is well known in the art to connect a control system with a temperature sensor to enable precise, closed loop control of the reaction temperature". The closed loop control is disclosed in claim 106, and not disclosed in Wilson et al. Hall et al. provides no insight as to whether a control system as disclosed therein would be a boon to the invention of Wilson et al., or even if the combination would be basically functional to carry out the reaction of Wilson et al. who did not appear to need the modification the Office Action suggests.

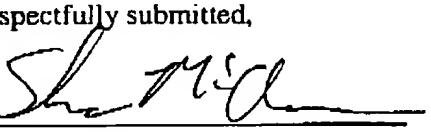
In addition, the Office Action states that the replacement of manual means with automated means is obvious. That does not appear to be in dispute. Claim 106 includes

a sensor, and Wilson et al. does not disclose such a structural or functional element. The Office Action attempts cure this deficiency by combining elements of Wilson et al. and Hall et al. The result of the combination is, unfortunately, a combination of a reaction that does not appear to need a sensor, and likely is workable in large temperature ranges, with a reaction that uses a sensor. Applicant submits that an explanation would be useful as to why one of ordinary skill in the art would take a simple and functional apparatus as shown in Wilson et al. and start adding components and control systems to increase the complexity and cost. As no such explanation has been proffered, Applicant submits that a *prima facie* case of obviousness has not been made, the rejection should be withdrawn, and a notice to that effect is respectfully requested.

New claims 147-155 are added to call out particular features of the invention and depend from allowable independent claims. Applicant submits that the subject matter in the new claims is fully supported in the specification, and that the elements should not entail any additional searching as the subject matter was included in the claims as filed.

Applicant submits that the pending claims are allowable over the cited art, and respectfully requests that a notice to that effect be issued. The Examiner is invited to contact the Applicant's undersigned representative at the telephone number below. Any additional fees for this Reply are hereby petitioned for, and the Director is authorized to charge such fees as may be required to Deposit Account 07-0868.

Respectfully submitted,



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